UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,363	09/24/2003	Afif Osseiran	2380-781	4781

23117 7590 01/03/2007

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
NGUYEN, TUAN HOANG	
ART UNIT	**PAPER NUMBER**
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/668,363	OSSEIRAN ET AL.	
	Examiner	Art Unit	
	Tuan H. Nguyen	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response To Arguments

1. Applicant's arguments, see applicant's remarks, filed on 10/12/2006, with respect to the rejection(s) of claims 1-37 under 35 U.S.C § 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Rejections - 35 USC § 112

2. Claims 23-25 recites the limitation "the radio resources" in page 6 of the amendment filed on 10/12/2006. There is insufficient antecedent basis for this limitation in the claim. However, claim 24 should depend on claim 23 instead of claim 22.

3, Claim 24, the word "here" renders the claims indefinite because it has an alterative meaning which does not positively identify the claims limitation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stefan Parkwall et al. (The Evolution of WCDMA Towards Higher Speed Downlink Packet Data Access, Proceeding IEEE Vehicular Technology Conference Spring, Rhodes, Greece, May 2001 hereinafter, "Parkwall") in view of Nilsson et al. (U.S PUB. 2002/0137485 hereinafter, "Nilsson").

Consider claim 1, Parkwall teaches a method for use in a radio communications system with a radio base station that includes multiple antennas associated with a cell, comprising: selecting multiple mobile radios to receive a transmission over a shared radio channel during a predetermined transmission time interval (see fig. 1 page 2 left column lines 42-50 through right column lines 16-43).

Parkwall does not explicitly show that transmitting information over the shared radio channel to the multiple mobile radios in the cell during the predetermined transmission time interval using multiple antenna beams so that interference from the transmission appears as white noise in time and in space.

In the same field of endeavor, Nilsson teaches transmitting information over the shared radio channel to the multiple mobile radios in the cell during the predetermined transmission time interval using multiple antenna beams so that interference from the transmission appears as white noise in time and in space (page 1 [0003] and page 3 [0034] and [0035]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, transmitting information over the shared radio channel to the multiple mobile radios in the cell during the predetermined transmission time interval using multiple antenna beams so that interference from the transmission appears as white noise in time and in space, as taught by Nilsson, in order to provide the mobile communications terminal relative to the base-station and movement of other objects affecting the transmission path between the base-station and the mobile communications terminal can affect the interference situation.

Consider claim 2, Parkwall further teaches the white noise is white additive Gaussian noise and one mobile radio is selected for one of the antenna beams (page 5 left column lines 2-21).

Consider claim 3, Parkwall further teaches the shared radio channel is a high speed-downlink shared channel (HS-DSCH) (page 2 left column lines 42-48).

Consider claim 4, Parkwall further teaches receiving reports from mobile radios of a detected channel quality of a pilot signal transmitted in the cell (page 4 left column lines 1-16), and scheduling transmissions to multiple mobile radios over the HS-DSCH for each transmission time interval based on the received reports (page 4 right column lines 39-54).

Consider claim 5, Parkwall further teaches selecting one of the mobile radios to receive a transmission from one of the antenna beams based on the received reports (page 1 right column lines 29-45), and transmitting the information over the HS-DSCH using each antenna beam to each selected mobile radio during the predetermined share time interval (page 1 right column lines 29-38).

Consider claim 6, Parkwall further teaches selecting an optimal coding and modulation scheme for each scheduled mobile radio to achieve an acceptable error rate (page 1 right column lines 14-28).

6. Claims 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkwall in view of Nilsson, and further in view of Walton et al. (U.S PAT. 7,020,110 hereinafter, "Walton").

Consider claim 7, Parkwall and Nilsson, in combination, fails to teaches splitting shared radio channel resources among the multiple mobile radios using a resource allocation scheme.

However, Walton teaches splitting shared radio channel resources among the multiple mobile radios using a resource allocation scheme (col. 40 lines 12-23).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Walton into view of Parkwall and Nilsson, in order to schedule terminals for data transmission on the downlink and/or uplink based

on the spatial and/or frequency "signatures" of the terminals and allocating resources in multiple-input multiple-output communication systems that utilize orthogonal frequency division multiplexing (i.e., MIMO-OFDM systems).

Consider claim 8, Walton further teaches the radio communications system is a CDMA-based system where radio channel resources include scrambling codes, each scrambling code having an associated channelization code tree, and wherein the resource allocation scheme allocates a scrambling code to the shared radio channel and allocating one or more different channelization codes associated with the shared radio channel scrambling code to each antenna beam during the predetermined transmission time interval (col. 4 line 60 through col. 5 line 11).

Consider claim 9, Walton further teaches the radio communications system is a CDMA-based system where radio channel resources include scrambling codes, each scrambling code having an associated channelization code tree, and wherein the resource allocation scheme allocates a different scrambling code for each antenna beam during the predetermined transmission time interval (col. 40 line 60 through col. 41 line 12).

Consider claim 10, Walton further teaches the resource allocation scheme divides the shared radio channel resources evenly between the multiple mobile radios

(col. 23 lines 40-44).

Consider claim 11, Walton further teaches the resource allocation scheme divides the shared radio channel resources in proportion to each mobile radio's reported detected channel quality (col. 7 lines 30-39).

Consider claim 12, Walton further teaches the resource allocation scheme divides the shared channel resources using a non-linear relationship between two or more of the following: amount of channel resources, throughput, quality of service, and detected channel quality (col. 10 lines 40-55).

Consider claim 13, Walton further teaches the non-linear relationship is stored in a look-up table (col. 49 lines 25-45).

Consider claim 14, Walton further teaches detecting a change in radio channel conditions (col. 50 lines 25-28), and updating the look-up table based on changed radio channel conditions (col. 29 lines 24-37).

Consider claim 15, Walton further teaches the transmitting to the multiple mobile radios in the cell during the predetermined transmission time interval using multiple antenna beams prevents a flashlight effect from disrupting the channel quality detection performed by the mobile radios (col. 49 lines 14-24).

7. Claims 16-22 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkwall in view Luschi et al. (U.S PUB. 2003/0045288 hereinafter, "Luschi").

Consider claim 16, Parkwall teaches a radio base station for use in a radio communications system, comprising: multiple antennas associated with a cell for generating multiple antenna beams, each beam covering only a portion of the cell (page 2 left column lines 42-50 through right column lines 16-50 and page 3 left column lines 1-11); and a channel scheduler for selecting multiple mobile radios to receive a transmission over a shared radio channel during a predetermined transmission time interval (page 2 left column lines 42-50 through right column lines 16-50 and page 3 left column lines 1-11).

Parkwall does not explicitly show that one or more transmit buffers; and transceiving circuitry for transmitting information stored in the one or more transmission buffers over the shared radio channel via the adaptive antenna array to the multiple mobile radios in the cell during the same predetermined transmission time interval using multiple antenna beams to spread out the interference caused by the transmission.

In the same field of endeavor, Luschi teaches one or more transmit buffers (page 2 [0027]); and transceiving circuitry for transmitting information stored in the one or more transmission buffers over the shared radio channel via the adaptive antenna array to the multiple mobile radios in the cell during the same predetermined transmission

time interval using multiple antenna beams to spread out the interference caused by the transmission (page 1 [0007] page 2 [0027] and page 3 [0042]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, one or more transmit buffers; and transceiving circuitry for transmitting information stored in the one or more transmission buffers over the shared radio channel via the adaptive antenna array to the multiple mobile radios in the cell during the same predetermined transmission time interval using multiple antenna beams to spread out the interference caused by the transmission, as taught by Luschi, in order to provide at least one of the channels carries control information in a format containing status information of the buffer of the user terminal and information of downlink received signal quality.

Consider claim 17, Parkwall further teaches the interference from the transmission appears as white noise in time and in space in the cell and one mobile radio is selected for one of the antenna beams (page 5 left column lines 2-21).

Consider claim 18, Parkwall further teaches the white noise is white additive Gaussian noise (page 5 left column lines 2-21).

Consider claim 19, Parkwall further teaches the radio channel is a high speed-downlink shared channel (page 2 left column lines 42-48).

Consider claim 20, Parkwall further teaches a channel quality controller for receiving reports from mobile radios of a detected channel quality of a pilot signal transmitted in the cell (page 4 left column lines 1-16), wherein the scheduler is configured to schedule transmissions to multiple mobile radios over the HS-DSCH for each transmission time interval based on the received reports (page 4 right column lines 39-54).

Consider claim 21, Parkwall further teaches the scheduler is configured to select one of the mobile radios to receive a transmission from one of the antenna beams based on the received reports (page 1 right column lines 29-45), and wherein the transceiving circuitry is configured to transmit the information over the HS-DSCH using each antenna beam to each selected mobile radio during the predetermined transmission time interval (page 1 right column lines 29-38).

Consider claim 22, Parkwall further teaches the scheduler is configured to select an optimal coding and modulation scheme for each scheduled mobile radio to achieve an acceptable error rate (page 1 right column lines 14-28).

Consider claim 32, Parkwall further teaches the multiple antennas include an adaptive antenna array (page 1 right column lines 46-50).

Consider claim 33, Parkwall further teaches the multiple antennas include transmit diversity antennas (page 1 right column lines 46-50).

8. Claims 23-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkwall in view of Luschi, and further in view of Walton et al. (U.S PAT. 7,020,110 hereinafter, "Walton").

Consider claim 23, Parkwall and Luschi, in combination, fails to teaches the scheduler is configured to split the radio resources of the shared radio channel among the multiple mobile radios using a resource allocation scheme.

However, Walton teaches the scheduler is configured to split the radio resources of the shared radio channel among the multiple mobile radios using a resource allocation scheme (col. 40 lines 12-23).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Walton into view of Parkwall and Luschi, in order to schedule terminals for data transmission on the downlink and/or uplink based on the spatial and/or frequency "signatures" of the terminals and allocating resources in multiple-input multiple-output communication systems that utilize orthogonal frequency division multiplexing.

Consider claim 24, Parkwall and Luschi, in combination, fails to teaches the radio communications system is a CDMA-based system here radio channel resources include

scrambling codes, each scrambling code having an associated channelization code tree, and wherein the resource allocation scheme includes allocating a scrambling code to the shared radio channel and allocating one or more different channelization codes associated with the shared radio channel scrambling code to each antenna beam during the predetermined transmission time interval.

However, Walton teaches the radio communications system is a CDMA-based system here radio channel resources include scrambling codes, each scrambling code having an associated channelization code tree, and wherein the resource allocation scheme includes allocating a scrambling code to the shared radio channel and allocating one or more different channelization codes associated with the shared radio channel scrambling code to each antenna beam during the predetermined transmission time interval (col. 4 line 60 through col. 5 line 11).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Walton into view of Parkwall and Luschi, in order to schedule terminals for data transmission on the downlink and/or uplink based on the spatial and/or frequency "signatures" of the terminals and allocating resources in multiple-input multiple-output communication systems that utilize orthogonal frequency division multiplexing.

Consider claim 25, Walton further teaches the radio communications system is a CDMA-based system where radio channel resources include scrambling codes, each scrambling code having an associated channelization code tree, and wherein the

resource allocation scheme includes transmission allocating a different scrambling code for each antenna beam during the predetermined time interval (col. 40 line 60 through col. 41 line 12).

Consider claim 26, Walton further teaches the resource allocation scheme includes dividing the shared radio channel resources evenly between the multiple mobile radios (col. 23 lines 40-44).

Consider claim 27, Walton further teaches the resource allocation scheme includes dividing the shared radio channel resources in proportion to each mobile radio's reported detected channel quality (col. 7 lines 30-39).

Consider claim 28, Walton further teaches the resource allocation scheme includes dividing the shared channel resources using a non-linear relationship between two or more of the following: amount of channel resources, throughput, quality of service, and detected channel quality (col. 10 lines 40-45).

Consider claim 29, Walton further teaches the non-linear relationship is stored in a look-up table (col. 49 lines 25-45).

Consider claim 30, Walton further teaches the scheduler is configured to: detect a change in radio channel conditions (col. 50 lines 25-28), and update the look-up table

based on changed radio channel conditions (col. 29 lines 24-37).

Consider claim 31, Walton further teaches the transmission via the adaptive antenna array to multiple mobile radios in the cell during the same predetermined transmission time interval using multiple antenna beams prevents a flashlight effect from disrupting the channel quality detection performed by the mobile radios (col. 49 lines 14-24).

9. Claims 34 and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkwall in view Teo et al. (U.S PUB. 2002/0086708 hereinafter, "Teo").

Consider claim 34, Parkwall teaches a method for use in a radio communications system with a radio base station that includes multiple antennas associated with a cell, comprising: selecting mobile radios to receive a transmission over a shared radio channel using a beam transmission sequence order (see fig. 1 page 2 left column lines 42-50 through right column lines 16-43); and transmitting information over the shared radio channel using one beam to one or more mobile radios following the beam transmission sequence order for multiple predetermined time intervals (see fig. 1 page 2 left column lines 42-50 through right column lines 16-43).

Parkwall does not explicitly show that performing beam switching in accordance with the beam transmission sequence order after multiple transmission time intervals so that the flashlight effect is avoided.

In the same field of endeavor, Teo teaches performing beam switching in accordance with the beam transmission sequence order after multiple transmission time intervals so that the flashlight effect is avoided (page 8 [0074] and page 9 [0079]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, performing beam switching in accordance with the beam transmission sequence order after multiple transmission time intervals so that the flashlight effect is avoided, as taught by Teo, in order to provide the beam transmitting the data traffic information is a directional beam to ensure sufficient power is directed at the target mobile terminal(s) while the beam transmitting the service information can either be a sector omni-directional beam or a rotating directional beam.

Consider claim 36, Parkwall further teaches the shared radio channel is a high speed-downlink shared channel (page 2 left column lines 42-48).

Consider claim 37, Parkwall further teaches receiving reports from mobile radios of a detected channel quality of a pilot signal transmitted in the cell (page 4 right column lines 1-16), and scheduling transmissions to one of the mobile radios over the HS-DSCH for more than one transmission time interval in accordance with the beam transmission sequence based on the received reports (page 4 right column lines 39-54).

10. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parkwall in view of Teo, and further in view of Nilsson.

Consider claim 35, Parkwall and Teo, in combination, fails to teaches the interference from the transmission appears as white noise in time and in space.

However, Nilsson teaches the interference from the transmission appears as white noise in time and in space (page 1 [0003] and page 3 [0034]).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Nilsson into view of Parkwall and Teo, in order to provide the mobile communications terminal relative to the base-station and movement of other objects affecting the transmission path between the base-station and the mobile communications terminal can affect the interference situation.

Conclusion

11. Any response to this action should be mailed to:

Mail Stop_____ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Facsimile responses should be faxed to:

(571) 273-8300

Hand-delivered responses should be brought to:

Customer Service Window

Randolph Building

401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571) 272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information Consider the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

12-22-06

LANA LE
PRIMARY EXAMINER

T.N

Tuan Nguyen
Examiner
Art Unit 2618